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the determination of the magnetic intensity, and with the separate adjustments required in erecting it.

3. The constants to be determined—the magnitude of the added weight, and the radius of the pulley by which it acts—can be ascertained with more ease and certainty than those which are required in the method of vibrations, and are less liable to subsequent change.

4. The observations themselves are less varied in character than the usual ones, and may be completed in a shorter time.

The REV. DR. LLOYD also read a paper—

ON AN IMPROVED FORM OF THE THEODOLITE MAGNETOMETER.

DR. LLOYD exhibited to the Academy an improved form of the Theodolite Magnetometer, constructed under his direction by Mr. Jones of London, for the Magnetic Survey of the British Islands now in progress.

The principle of the improvement consists in observing the celestial object, whose azimuth is known, *by reflexion*, and in transferring the necessary adjustments to the small mirror used for that purpose. A light gun-metal frame, 13 inches long, and 3 inches wide, is attached to the upper plate of the theodolite. Near one end of this frame are two Y supports, placed longitudinally, to receive the observing telescope; and near the other are two similar supports, placed transversely, to receive the cylindrical axle to which the mirror is attached. The magnetometer box is placed between, over the centre of the divided circle. The telescope, accordingly, remains *horizontal*, and is always in adjustment for the observation of the collimator magnet; and the image of the celestial object is brought to the cross of wires in its focus, by turning the apparatus in azimuth, and, at the same time, causing the mirror to revolve. The axle is furnished with a slow motion for the purpose.

There are three adjustments required:—

1. The axle to which the mirror is attached must be horizontal when the instrument is levelled. This is tested by a small riding-level. It may be effected permanently, with sufficient exactness, by filing one of the Y's.

2. The *mirror* must be parallel to the axis of the cylindrical axle to which it is attached. This is tested by reversing the axle in its Y's, and by noting the reflected division of a scale cut by the wire in the focus of the telescope, before and after reversal. The adjustment is effected by means of three screws at the back of the mirror.

3. The line of collimation of the telescope must be perpendicular to the axis. This may be tested by observing a well-defined distant object in the horizon, first by reflexion, and afterwards directly; the deviation of the line of collimation from the normal to the mirror is half the supplement of the angle through which the telescope is moved. The adjustment may be most readily made by moving the wire-plate in the focus of the telescope.

SIR WILLIAM R. HAMILTON read a paper "On some General Theorems in the Calculus of Definite Integrals."

MONDAY, JANUARY 25, 1858.

JAMES H. TODD, D. D., President, in the Chair.

THE REV. WILLIAM REEVES, D. D., read a paper "On the Cathach of Columcille" (deposited in the Museum of the Academy by Sir Richard O'Donnell, Bart.)

JOHN KELLS INGRAM, LL. D., read a paper—

ON THE OPUS MAJUS OF ROGER BACON.

AFTER some introductory observations on the unjust neglect with which the writings of Roger Bacon have hitherto been treated, the author proceeded as follows:—

In the course of my studies I have been able to clear up one unsettled question respecting the works of this eminent man; and I have thought it probable that the Academy would be interested by any contribution, however small, towards our knowledge of a subject so imperfectly understood.

The "Opus Majus" has always been regarded as the most important of Bacon's writings. It was written in the year 1267, and sent to Pope Clement IV. in consequence of the desire expressed by that Pontiff that Bacon would communicate to him the substance of his researches. A beautiful MS. of the work exists in the Library of Trinity College, Dublin, and from this MS. it was edited by Samuel Jebb, at London, in 1783. It is to this edition, or to the reprint of it at Venice, in 1750, that all the historians of philosophy have referred. The work, as published by Jebb, contains six parts, the subjects of which are as follows:—

In the first Bacon points out the four universal causes of human ignorance; in the second he treats of the relation of philosophy to theology; in the third, of grammar and the knowledge of languages; in the fourth, of mathematics, including astronomy and geography; in the fifth, of *perspectiva*, or optics; and in the sixth, of experimental science.

When Bacon had composed the "Opus Majus," he drew up a second treatise, similar in substance, which he called his "Opus Minus," and which he also transmitted to the Pope. His object in doing so was partly to guard against the risk of the "Opus Majus" being lost, from the dangers which then beset travellers, and partly to present to his Holiness, in a condensed and improved form, its most essential contents. Not satisfied with this precaution, he prepared a third version of his great work, which he named his "Opus Tertium," "ad intellectum et perfectionem utriusque operis precedentis," and this also he transmitted to Clement. The two latter works have never been printed, but several copies of, at least, portions of them exist in the manuscript collections of Great Britain and continental Europe.